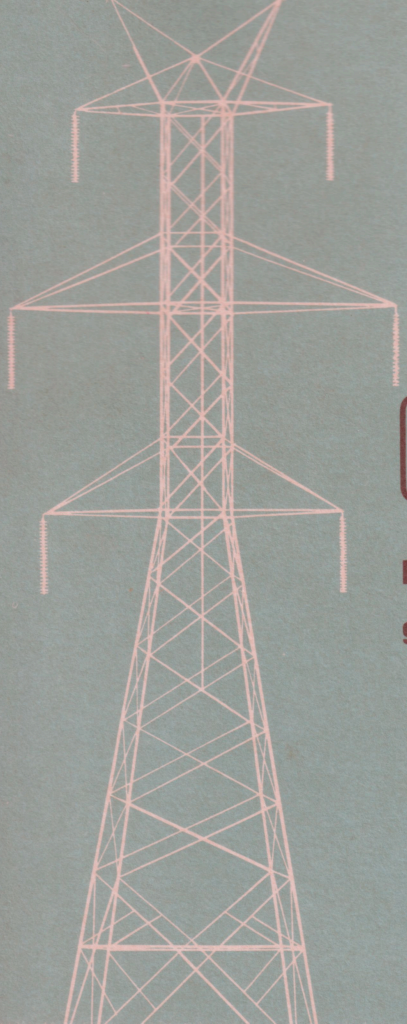
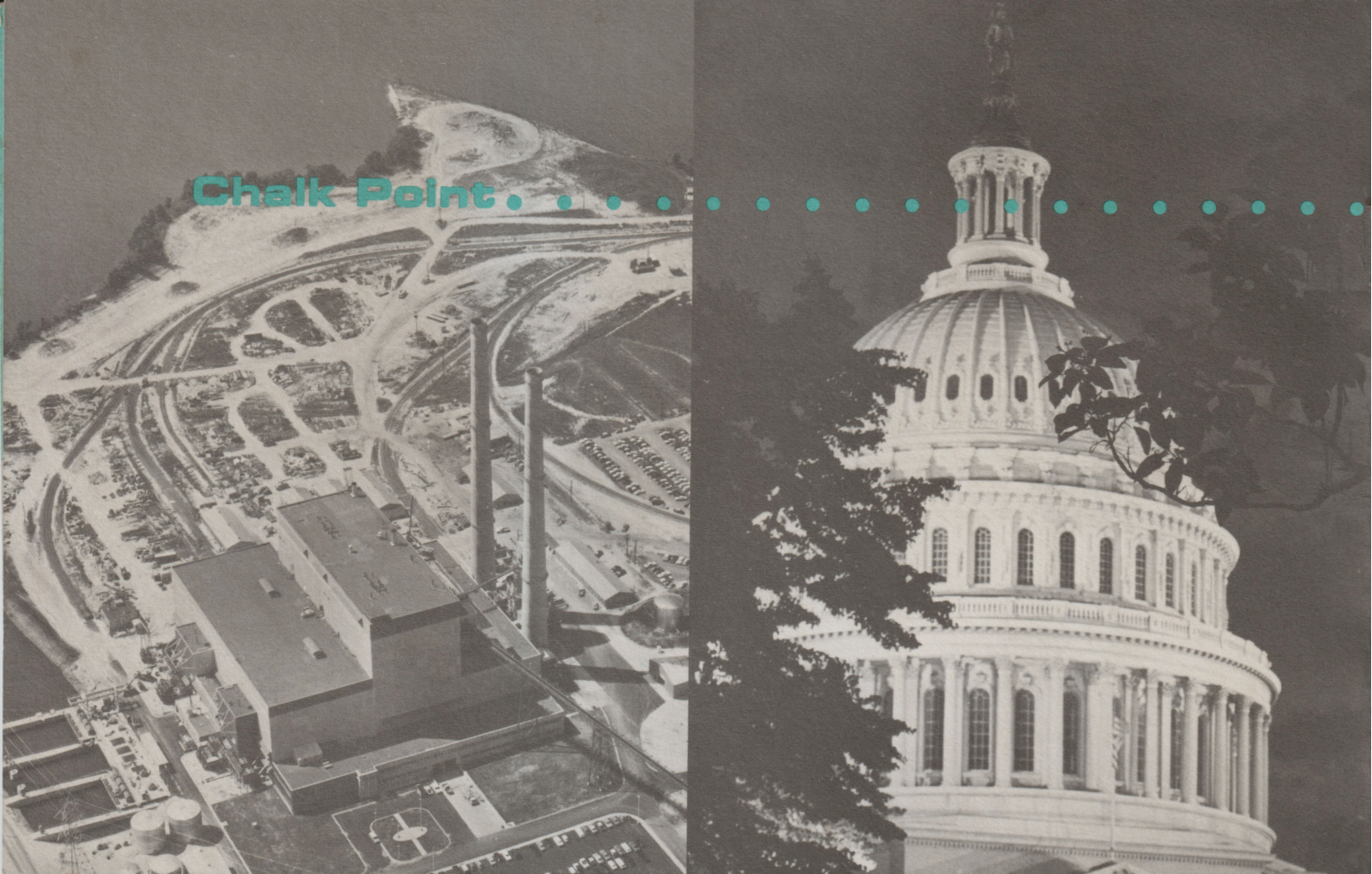
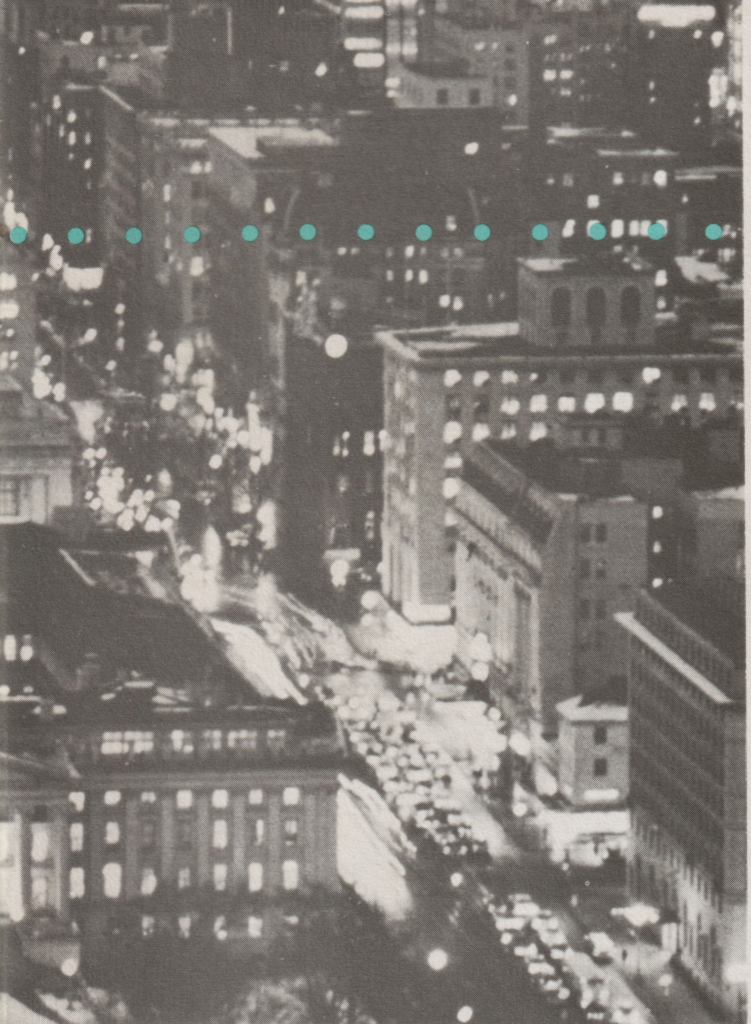


CHALK POINT.....

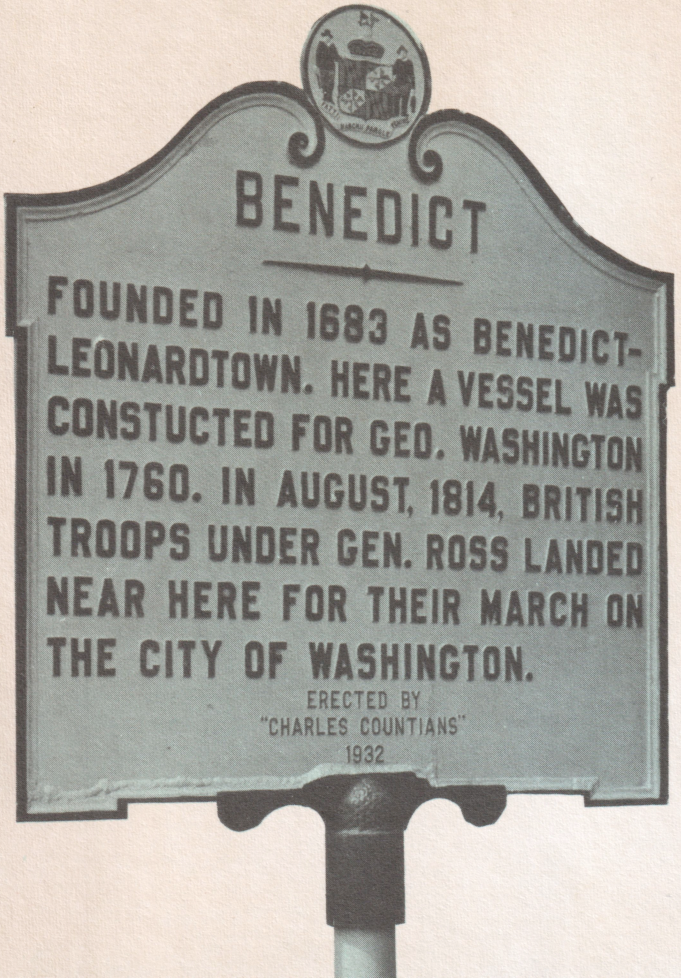
Pepco's newest and largest generating station


Chalk Point



Washington's Beacon to Progress

MONTGOMERY COUNTY
MARYLAND
WASHINGTON D.C.
VIRGINIA
PRINCE GEORGES COUNTY
CHALK POINT
BENEDICT
CHESAPEAKE BAY
PATUXENT R.
POTOMAC RIVER
Pepco service area


BENEDICT
FOUNDED IN 1683 AS BENEDICT-LEONARDTOWN. HERE A VESSEL WAS CONSTUCTED FOR GEO. WASHINGTON IN 1760. IN AUGUST, 1814, BRITISH TROOPS UNDER GEN. ROSS LANDED NEAR HERE FOR THEIR MARCH ON THE CITY OF WASHINGTON.
ERECTED BY
"CHARLES COUNTIANS"
1932

The Torch to Washington

In the late summer of 1814, a British force debarked from ships at Benedict, Maryland, a fishing village on the finger of the Chesapeake Bay known as the Patuxent River. After a few days of marching, these troops put the torch to the infant American capital of Washington.

A century and a half later, Washington is again lighted by a force from the same Patuxent River shore. But the force is different—this time it is the friendly one of electricity. And it lights, not the consuming flames of incendiarism, but the flameless torches of a city which in a relatively short but historic life has become the crown of a democratic nation, the star of the Western world.

Chalk Point: Woods and fields waited for the bulldozer, the piledriver, the steel and concrete that made an electric generating station.

In August of 1964, electricity began flowing to Washington and its surrounding communities from the Potomac Electric Power Company's new generating station at Chalk Point.

Located in the southeastern corner of Prince Georges County, on a flat point between the Patuxent River and Swanson Creek two miles north of Benedict, the Chalk Point Generating Station stands as a beacon to progress amid woods and tobacco and corn fields on one side and the tidal river and creek on the other.

Why electricity came to be generated at Chalk Point, and how, makes a fascinating and instructive story of a great city and the electric utility which serves it.

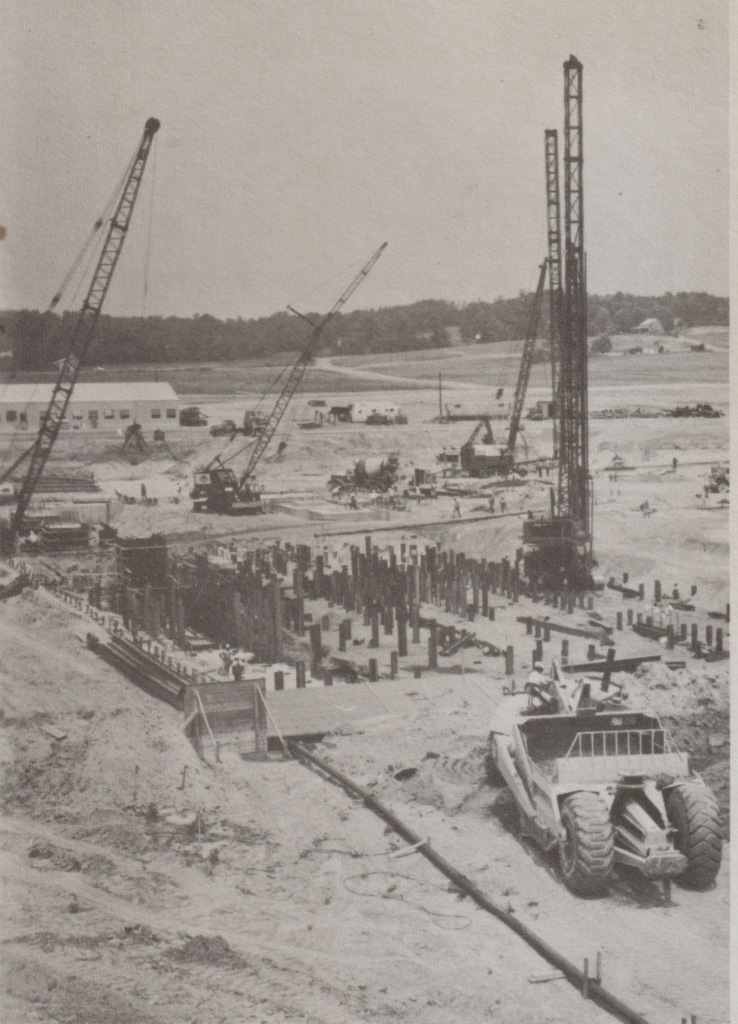
The 'Reason Why'

Washington is the "reason why" of PEPCO, and Chalk Point. There are many ways to measure a city—by its people, its buildings, its business—and by all of them Washington has had an amazing growth. A better measurement of a city might be by the electricity it consumes, for this gauges something of a city's quality—its prosperity, its growth—as well as its size. Washington comes off well by this standard, also.

PEPCO is 68 years old. It came into being when electricity was little more than a fancy. A few city blocks in Washington had electric street lights, and there were electric trolleys. But electricity had no past, only a future, and PEPCO had a power capability of only 2,000 kilowatts. As Washington grew, so did PEPCO, and this investor-owned public utility had to run fast to stay ahead.

The population of the Washington Metropolitan Area, which PEPCO serves, kept doubling and redoubling, and the uses of electricity multiplied. By 1933, PEPCO had a power capability in two generating stations of more than a quarter of a million kilowatts. By 1949, when another generating station was added, PEPCO's capability had more than doubled. In 1959, the Dickerson Generating Station began operation in Montgomery County, and PEPCO's power capability rose to 1¼ million kilowatts. Subsequent additions at Dickerson increased that capability to 1,640,000 kilowatts. But it still was not enough.

People kept coming to the Washington area as government grew and business prospered. And they were using more and more electricity—brighter lights in their homes and offices, greater numbers of electrical appliances, and far more electric air conditioners. Electric heating began to make progress. PEPCO's fifth generating station was needed, and Chalk Point was to be its home.



More than 3,000 concrete-filled steel piles were sunk to provide footings for the Chalk Point Station.

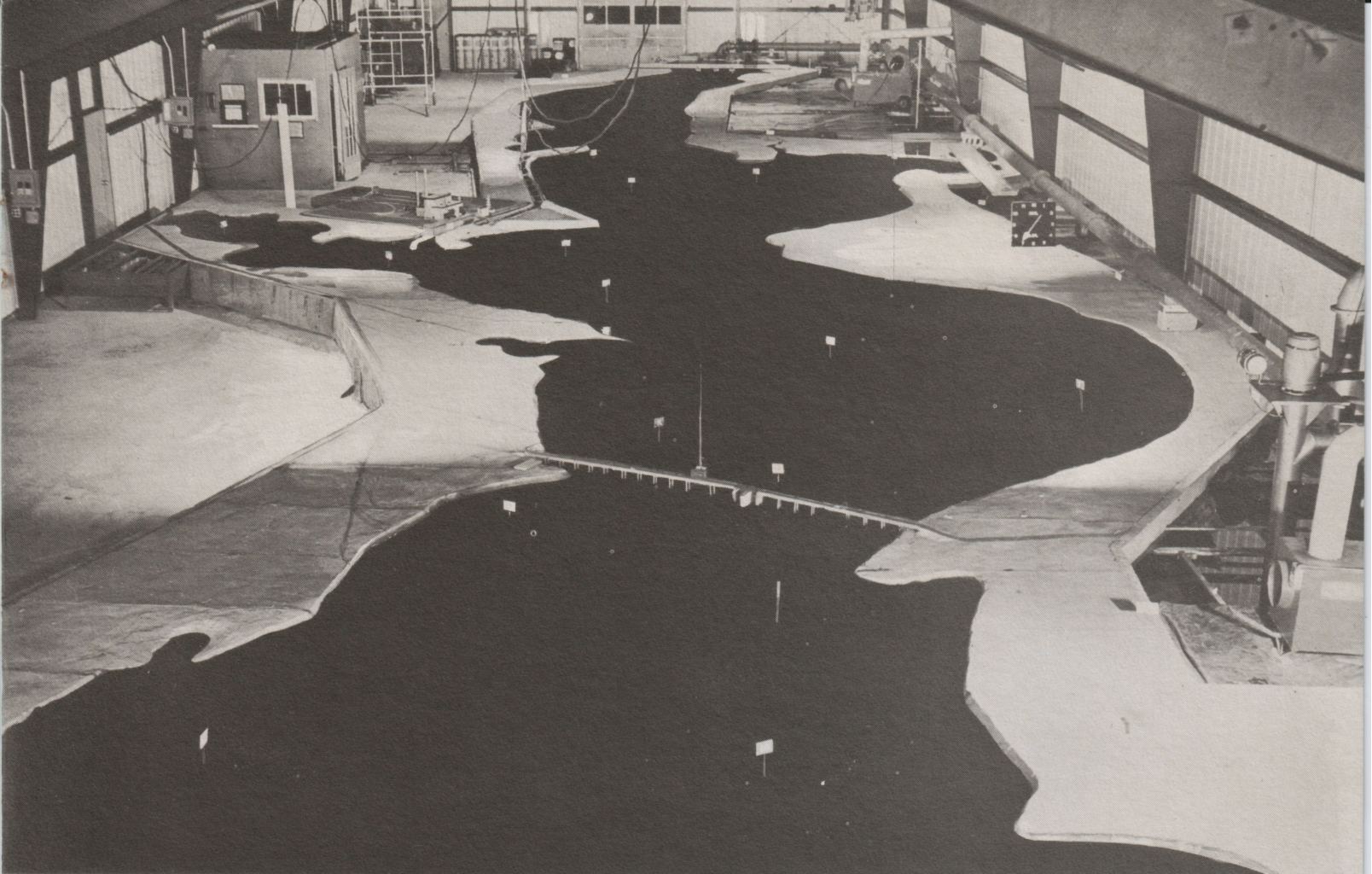
The Site

PEPCO generates its electricity by burning coal to produce steam which powers turbine-generators. For its new generating station, it needed a site where coal could be brought in by railroad. And since a station with a capability of 710,000 kilowatts was planned, PEPCO's engineers knew they needed a site with plenty of water—half a million gallons per minute—to condense steam back to water.

Chalk Point filled the bill, but the planning staff at PEPCO needed to know more about the site, and the effect the generating station would have on it. In particular, they wanted to be sure that the water which was taken into the plant, circulated for condensing purposes and discharged at a temperature 10 degrees above river temperature, would have no adverse effect on marine life in the Patuxent.

PEPCO engaged the Alden Hydraulic Laboratory at Worcester Polytechnic Institute to build a model of Chalk Point and the Patuxent, and conduct research to determine if natural tidal currents in the river would adequately dissipate the warm water, and if the warm water would affect the river's aquatic life. An eight mile stretch of the river was mapped and more than 3,000 soundings were made to create an accurate profile of the river bottom. Then the model was constructed, and the research work started. The results: The normal river currents would dissipate the warm water, and the fish, crabs, clams, and oysters of the Patuxent would continue to lead normal, healthy aquatic lives.

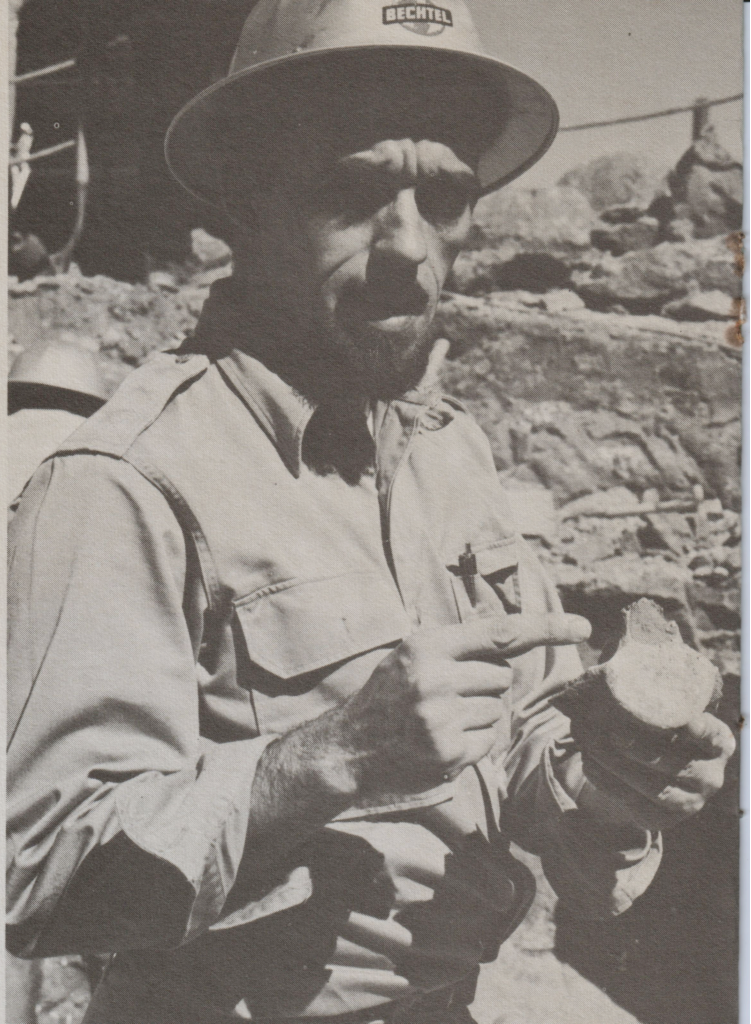
An eight-mile stretch of the Patuxent River is represented in this exact model. Experiments showed that the Chalk Point Station would have no adverse effect on aquatic life in the river.



The Squalodon Find

Planning for a $94 million power generating station like Chalk Point is a long and exacting task. It takes more than 3 years for studies, plans, problem solving, equipment purchasing and construction. Special equipment must be designed and manufactured, and thousands of detailed drawings must be checked and rechecked.

But there are always surprises, and it is a happy chance when they turn out to be both harmless and interesting. While Chalk Point was under construction, a workman digging a water discharge line in rock-hard blue clay 20 feet below the surface saw something strange. It was a well-preserved fossil of some kind, and there was enough interest to ask a paleontologist from the Smithsonian Institution to take a look. The fossil was that of an extinct whale, a squalodon, the paleontologist said. A whale in the Chesapeake? Yes, said the Smithsonian man, about 12 million years ago.



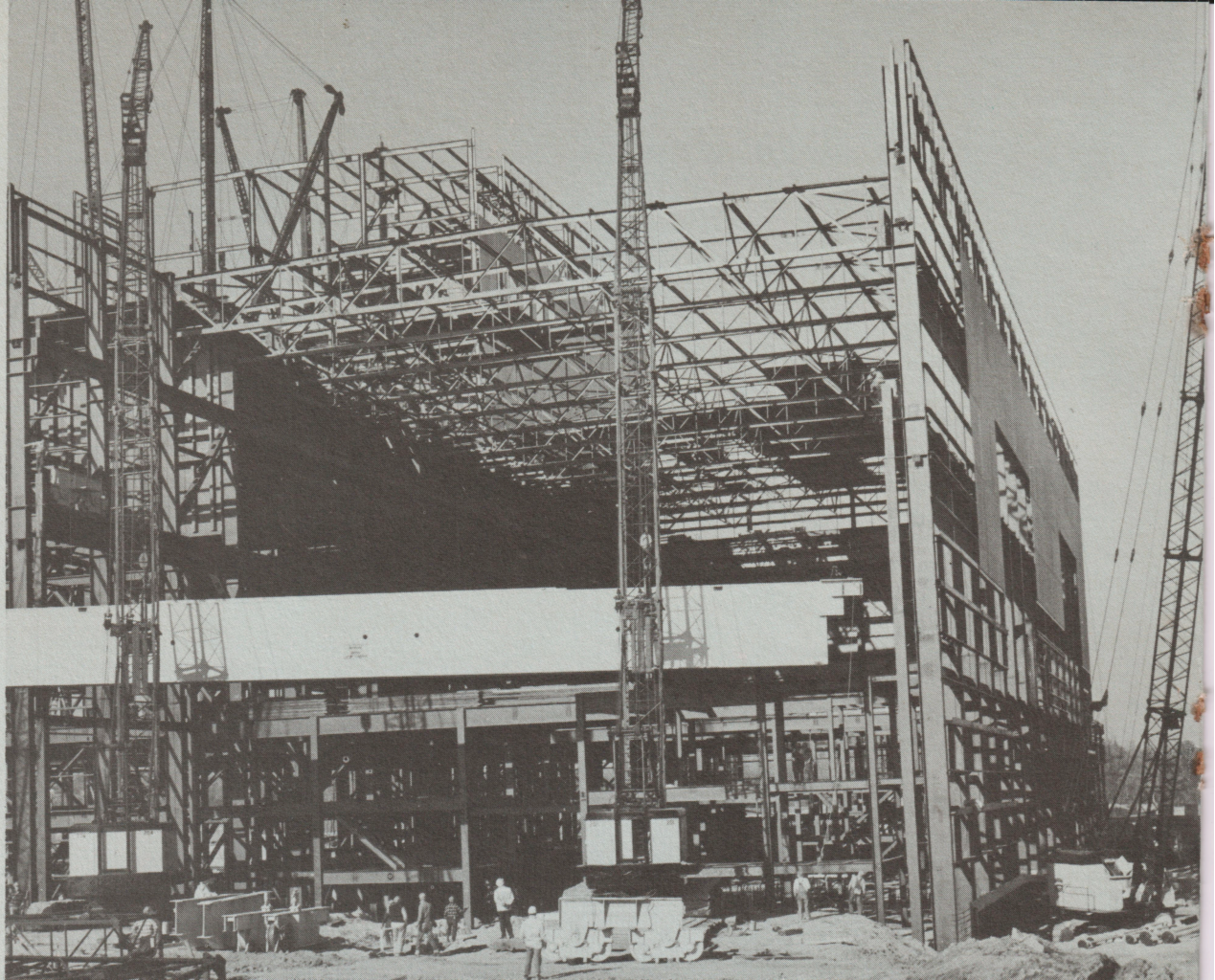
Construction Begins

Construction of Chalk Point required 2½ years. It began in February of 1962 when the engineering-constructor, Bechtel Corp., moved men and equipment onto the 1,160 acre site and began digging. Before the project was finished, men and machines had moved over two million cubic yards of earth to make way for the generating station and its equipment. They sank more than three thousand steel piles and they poured 53,000 cubic yards of concrete. To supply the new station with materials for construction and coal for operation, PEPCO built almost five miles of new railroad on the site, and The Pennsylvania Railroad constructed a six-mile spur to connect its line with PEPCO's.

To house Chalk Point's two 18 story high boilers, construction men built a steel-framed, asbestos-sided structure that is 182 feet high, 331 feet wide, and 421 feet long. They erected two 400 foot high concrete chimneys—chimneys that will never belch forth black smoke because the plant is equipped with efficient fly ash precipitators. To provide the plant with water, they dug a canal from Swanson Creek and installed two eight foot diameter pipes to carry 250,000 gallons of water per minute to each of Chalk Point's two generating units. To return the water to the Patuxent at the desired temperature and location, they dug another canal one and one-quarter miles long.

The first of Chalk Point's generating units, with a capability of 355,000 kilowatts, went on the line August 23, 1964. The second unit, with a like capability, will be placed in service in the spring of 1965.

Twelve million years ago, small whales inhabited the area now occupied by the Chalk Point Station. A paleontologist holds a fossil bone of a squalodon whale found during construction work at Chalk Point.



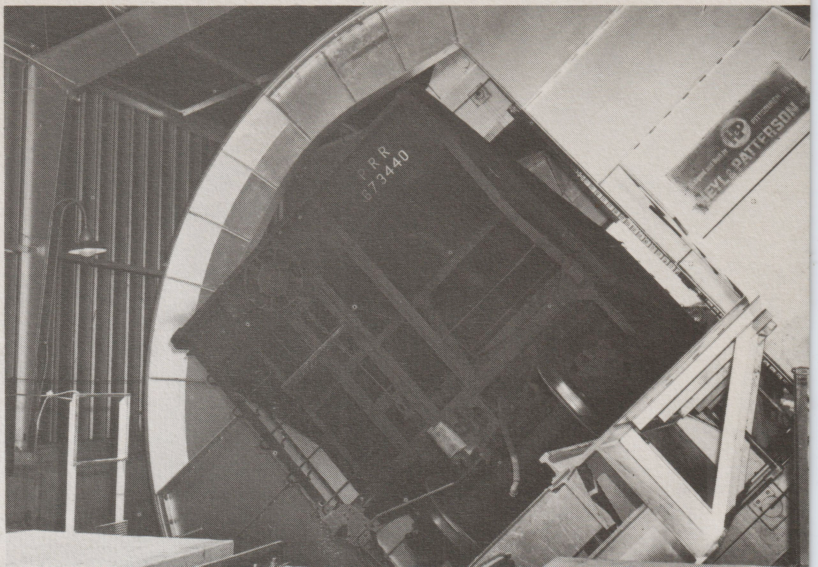
Chalk Point's boilers are housed in a steel-framed, asbestos-sided structure that is as high as an 18-story building, 331 feet wide, and 421 feet long.

Coal trains—100 cars long and carrying 7,000 tons of coal—are unloaded at Chalk Point in eight hours.

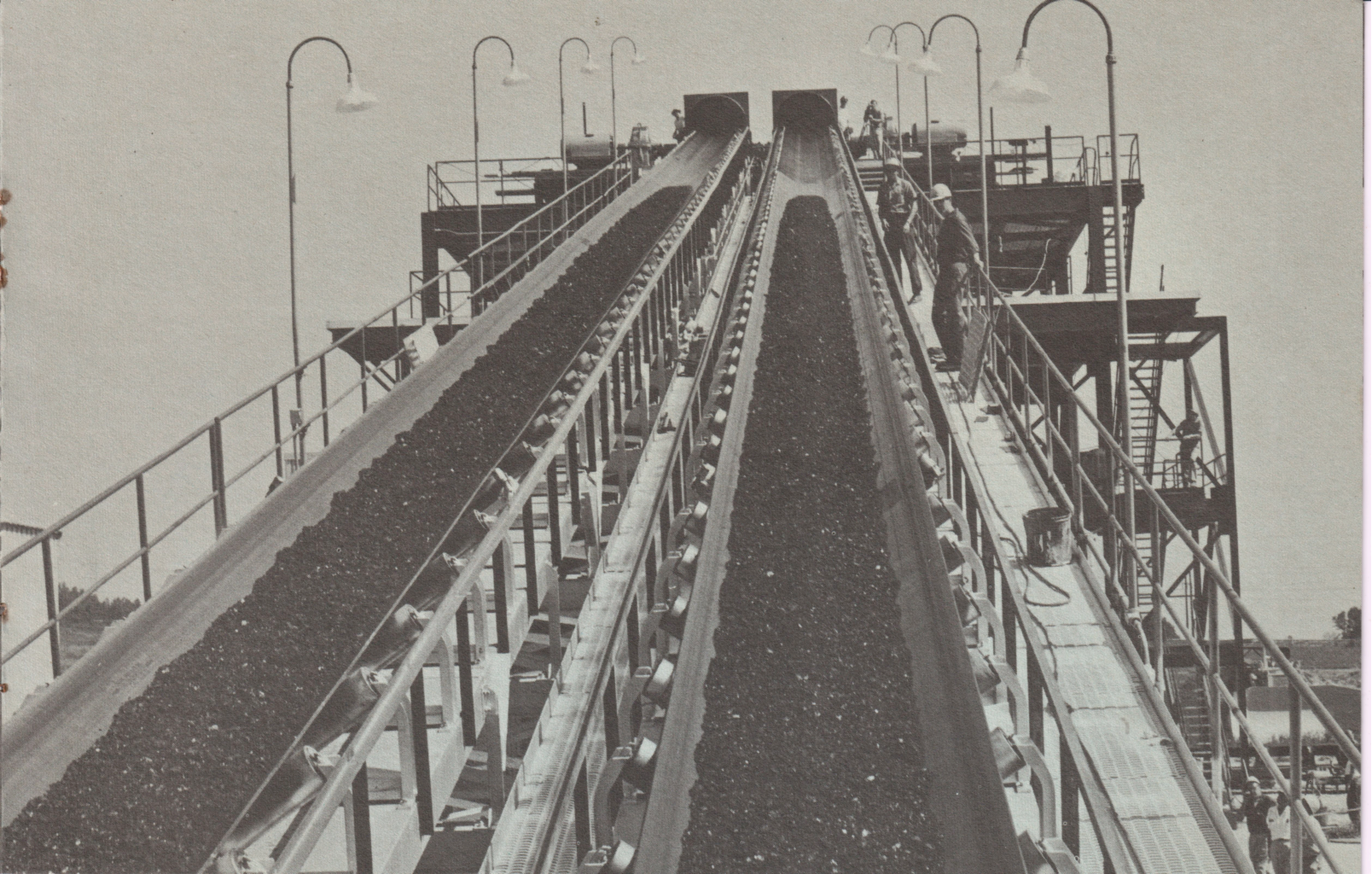
Food for the Giant

Chalk Point is a giant, with a giant's appetite. With both of its units at full capacity, it will consume 230 tons of coal per hour—about 1½ million tons a year.

To satisfy this voracious appetite, the designers of Chalk Point have created a marvel of industrial feeding—a unique and completely automatic coal-handling system. First come the coal trains from Pennsylvania, Maryland and West Virginia. They average 100 cars in length, and carry 7,000 tons of coal. The Chalk Point system can unload a 100-car train in eight hours.



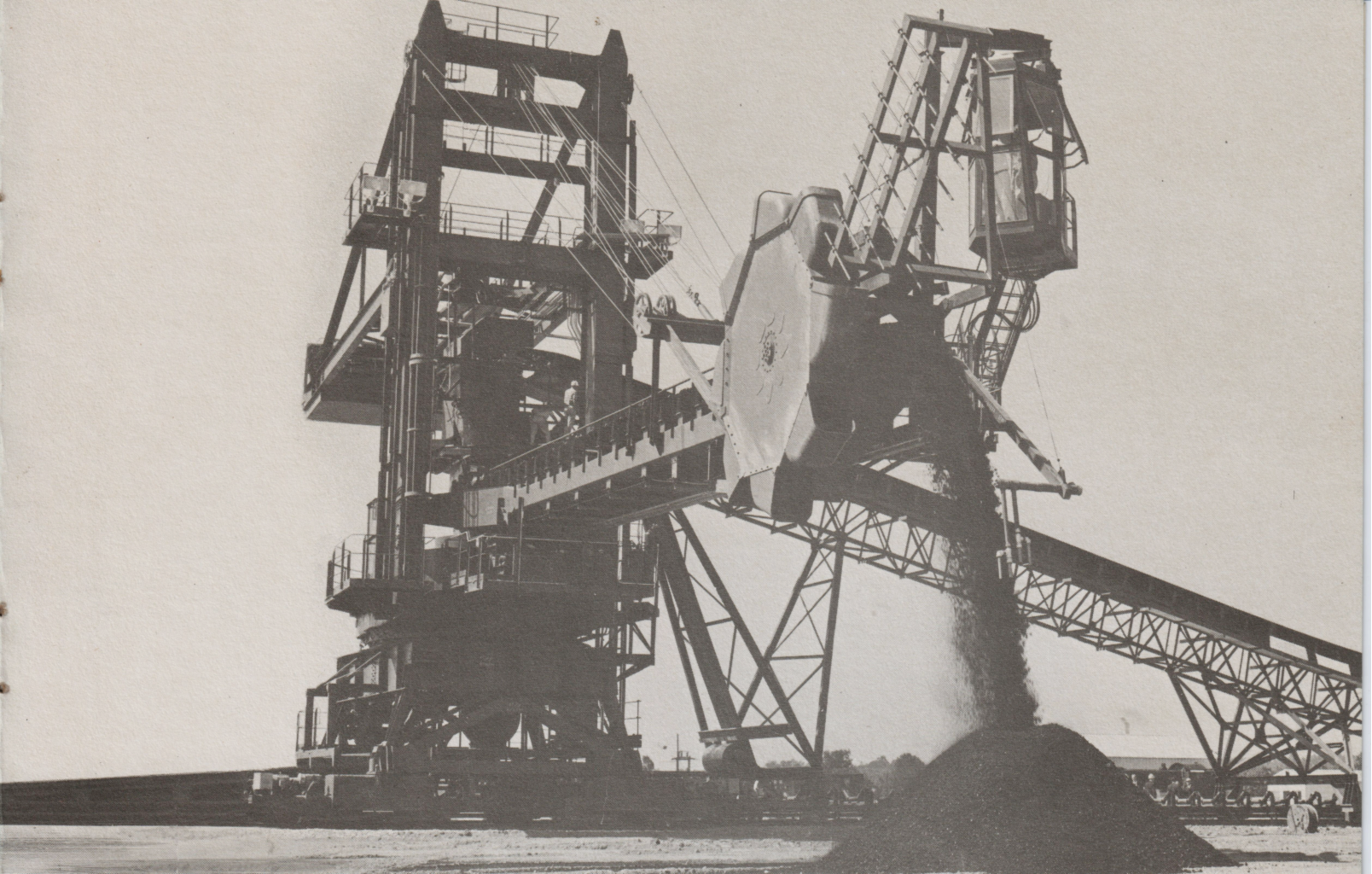
Like a giant handling a toy, a rotary dumper turns coal cars upside down and dumps the coal into underground hoppers.

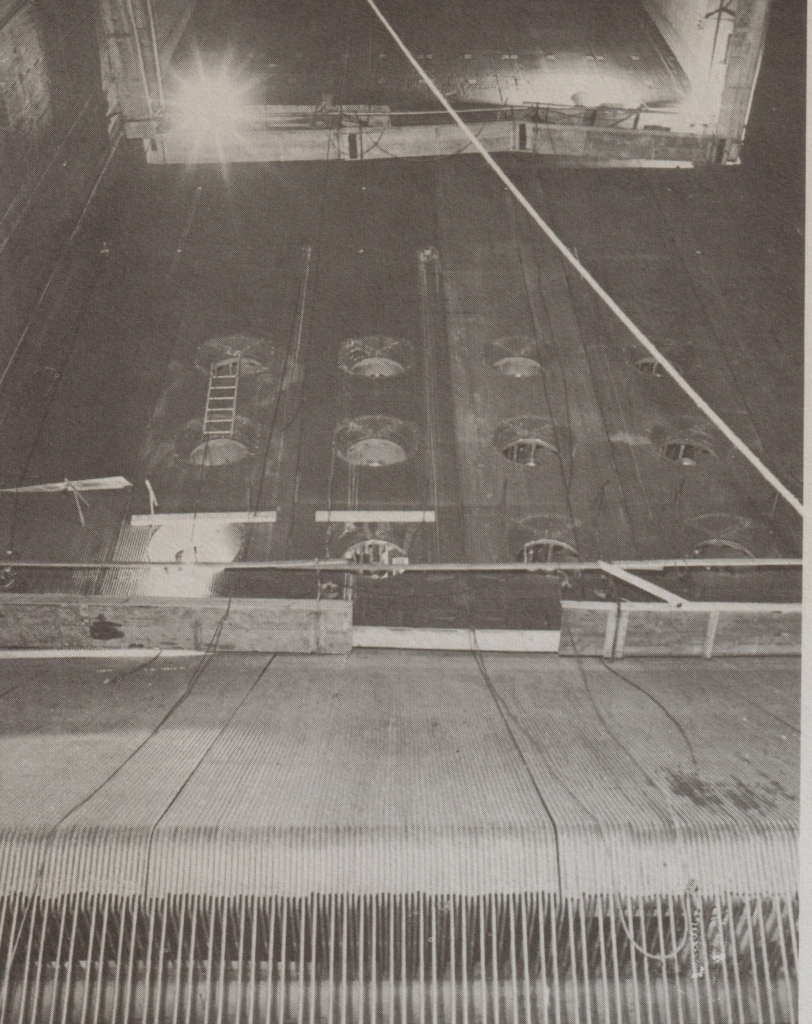


The capacity of this system is enormous. It can stack coal at a rate of 1,500 tons per hour. It can feed coal into the plant at a rate of 500 tons per hour. One of the first jobs undertaken by Chalk Point's coal-handling system was to build up a storage pile of 300,000 tons, enough to supply the plant for several months.

Control of the coal-handling system is another marvel. One operator at the rotary car dumper controls the weighing and dumping. He has before him a television screen which gives him a constant picture of the operation of the stacker-reclaimer. Operators in the central control room in the plant can see the stacker-reclaimer at work on still another television screen, and with controls at their fingertips they can feed 500 tons of coal each hour into the plant.

Unique and awesome, the "stacker-reclaimer" can dump coal in a pile for storage, and then take it out of the pile and send it on its way to Chalk Point's boilers.





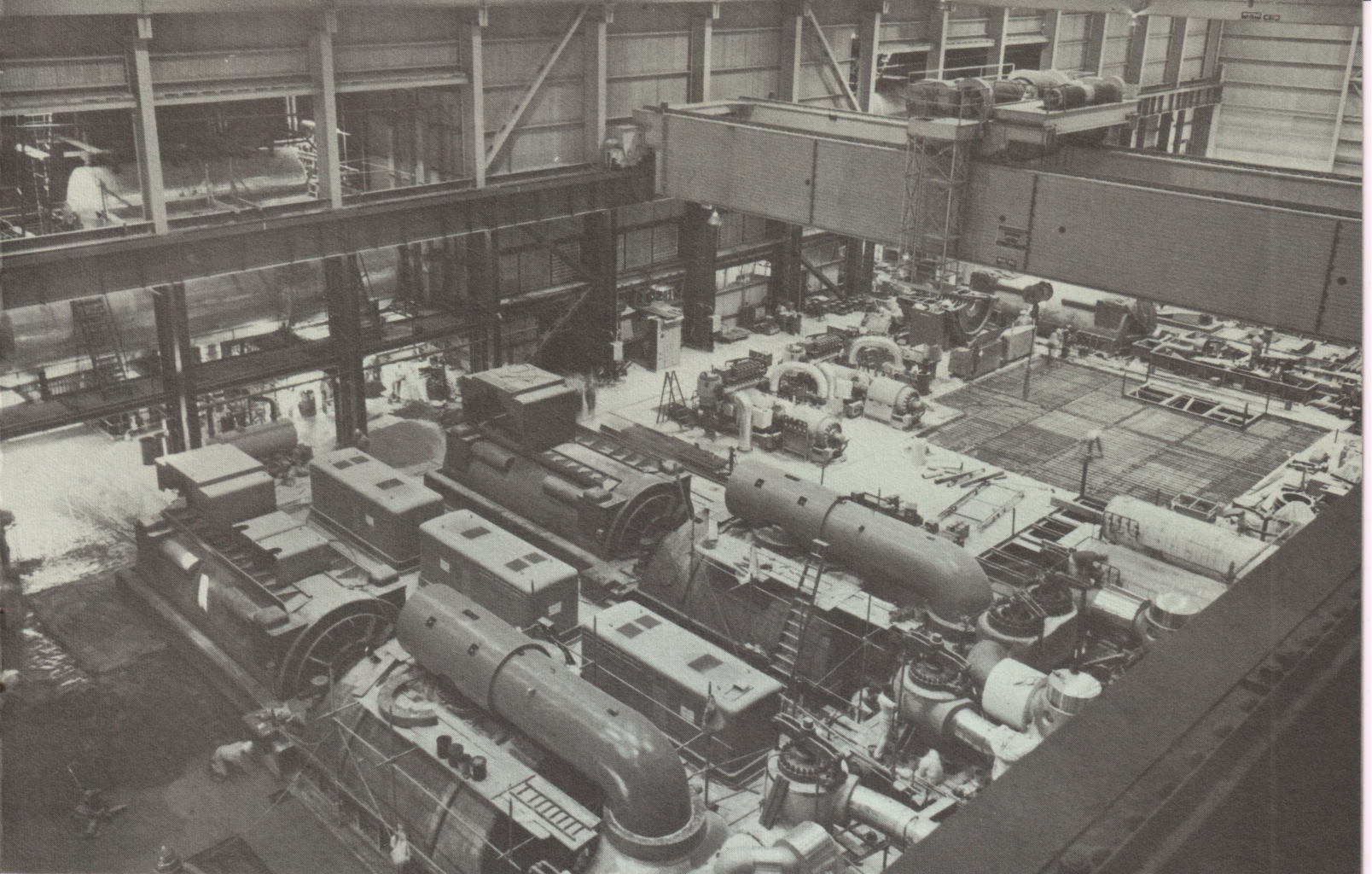
Boiler walls consist of steel tubing. Holes in the wall are some of the 24 burner openings through which pulverized coal is fed to each boiler.

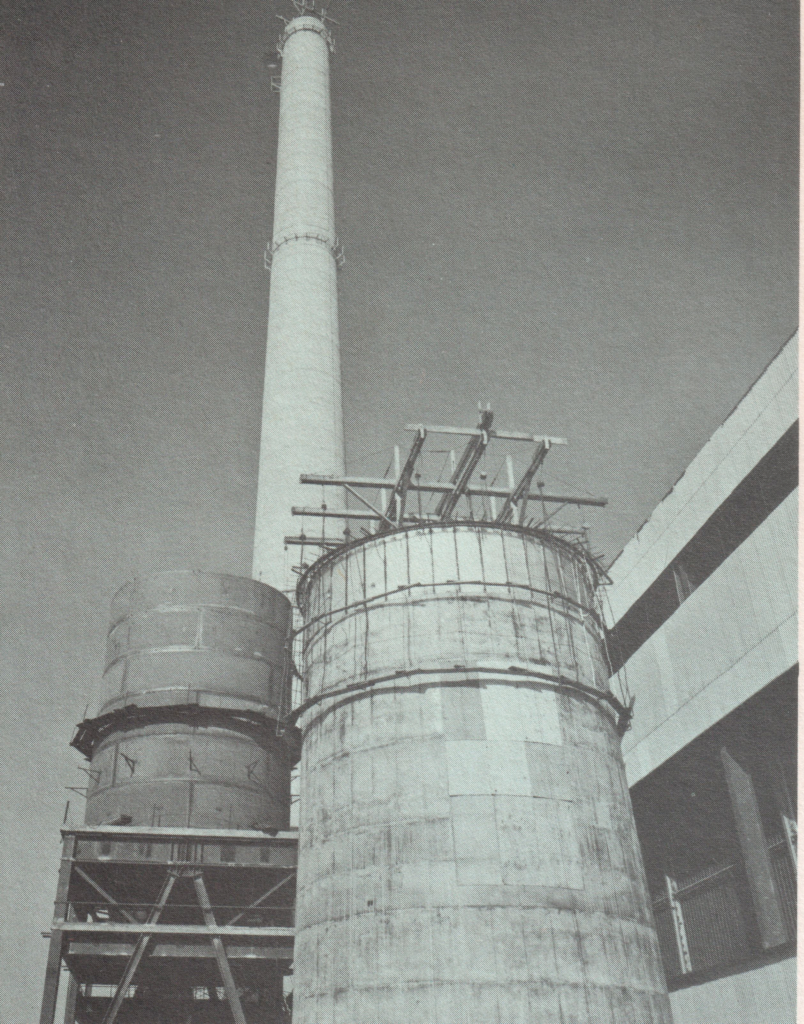
Boilers and Turbine-Generators

Inside the Chalk Point Generating Station, most of the space is taken up by boilers and turbine-generators. The boilers are metal creatures lined with many miles of steel tubing, and are as tall as an 18 story building—taller than any commercial building in Washington. The turbine-generators are squat monsters that turn at a fantastic speed of 3,600 revolutions per minute.

Before coal is burned, it is pulverized to the consistency of face powder. Then it is mixed with heated air and injected into the boiler. This process results in complete combustion of the fuel—increasing efficiency and reducing waste.

Turbine-generators are driven by steam injected at a tremendous velocity. A unit like this one will generate 355,000 kilowatts of electricity.



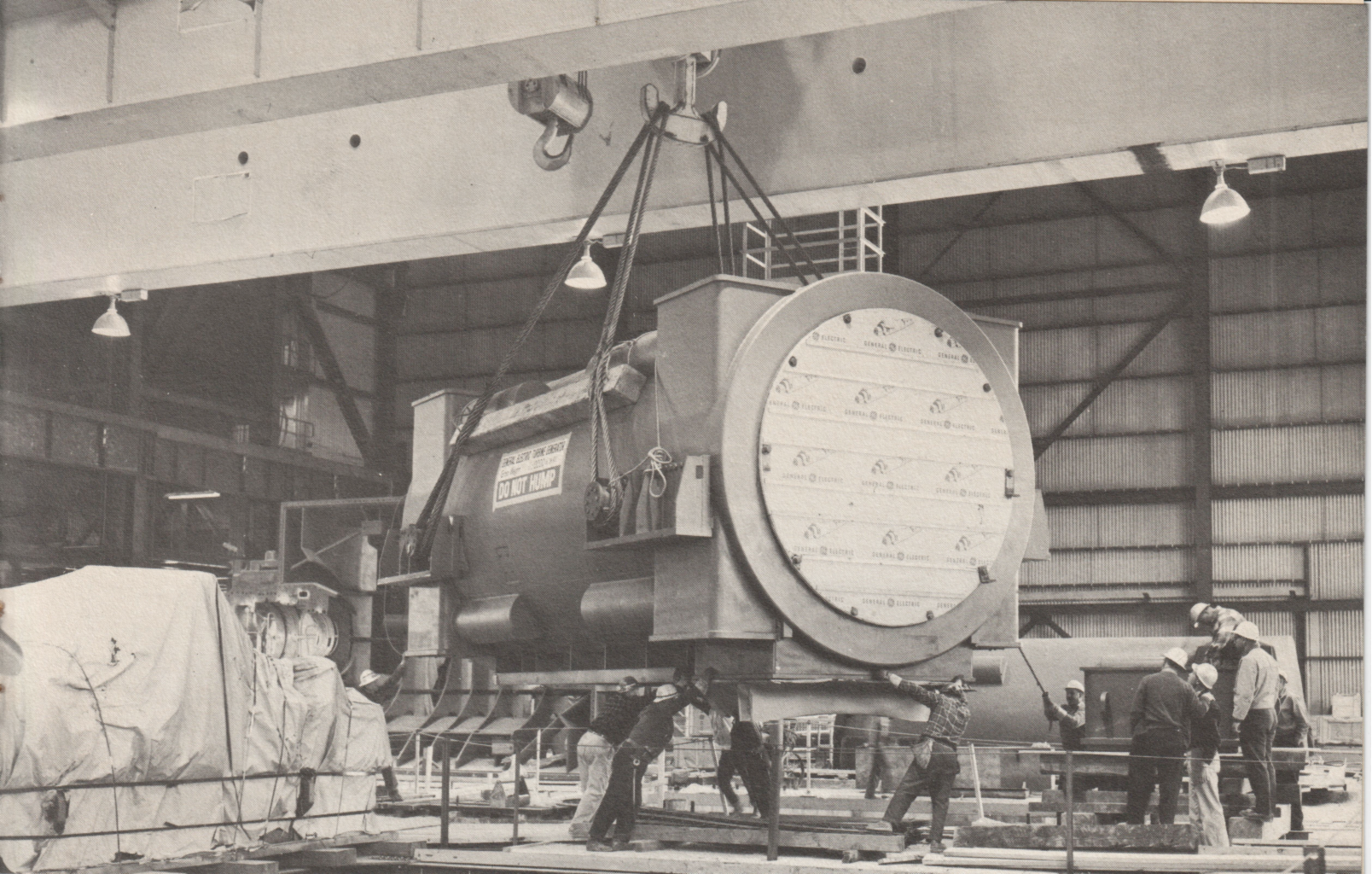


Chalk Point's second 400-foot-high concrete chimney goes up (the first one, already completed, is in the background).

The burning coal heats the 37,000 gallons of purified water in the pipes of each boiler and converts it to steam at a "supercritical" pressure of 3,500 pounds per square inch and at a temperature of 1,000 degrees Fahrenheit.

First, traveling at a tremendous velocity, the high-pressure steam hits the angled blades of the turbines, driving them at 3,600 revolutions per minute. The turbines spin generator-rotors which create magnetic "fields of force." These "fields of force" cut across the stationary armature coils of the generators, and this creates electricity—355,000 kilowatts of electricity from each of Chalk Point's two turbine-generator units.

A "stator," that is, the stationary outer portion of a generator, is placed inside the Chalk Point Station by means of a large overhead traveling crane.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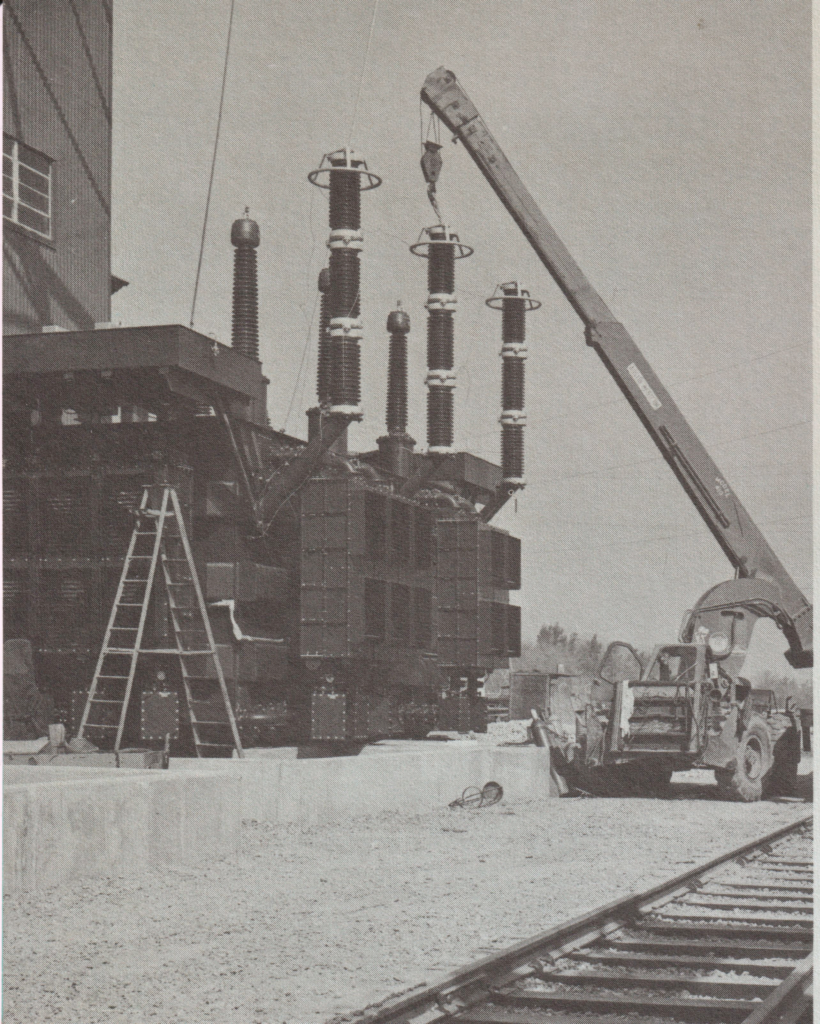
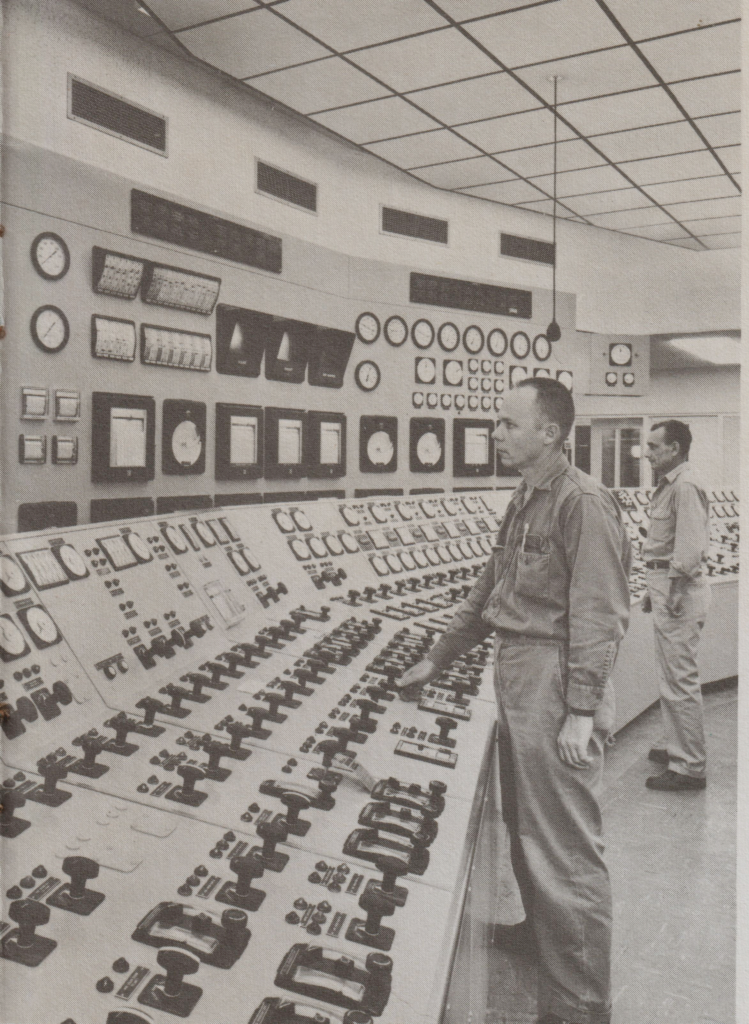


The Final Step

Chalk Point generates electricity at 20,000 volts, but to travel the high voltage transmission system of PEPCO, it must be stepped up to 230,000 volts. That's the job of a transformer, and from the transformer the high voltage current is directed through a switchyard onto the 48 miles of 230,000 volt transmission lines that were built to tie Chalk Point into the more than 15,000 circuit miles of transmission and distribution lines which feed the Washington Metropolitan Area.

Transformers like this one are used to step up Chalk Point's electricity from the 20,000 volts at which it is generated to the 230,000 volts needed for transmission over PEPCO's lines.



Controlling Hands

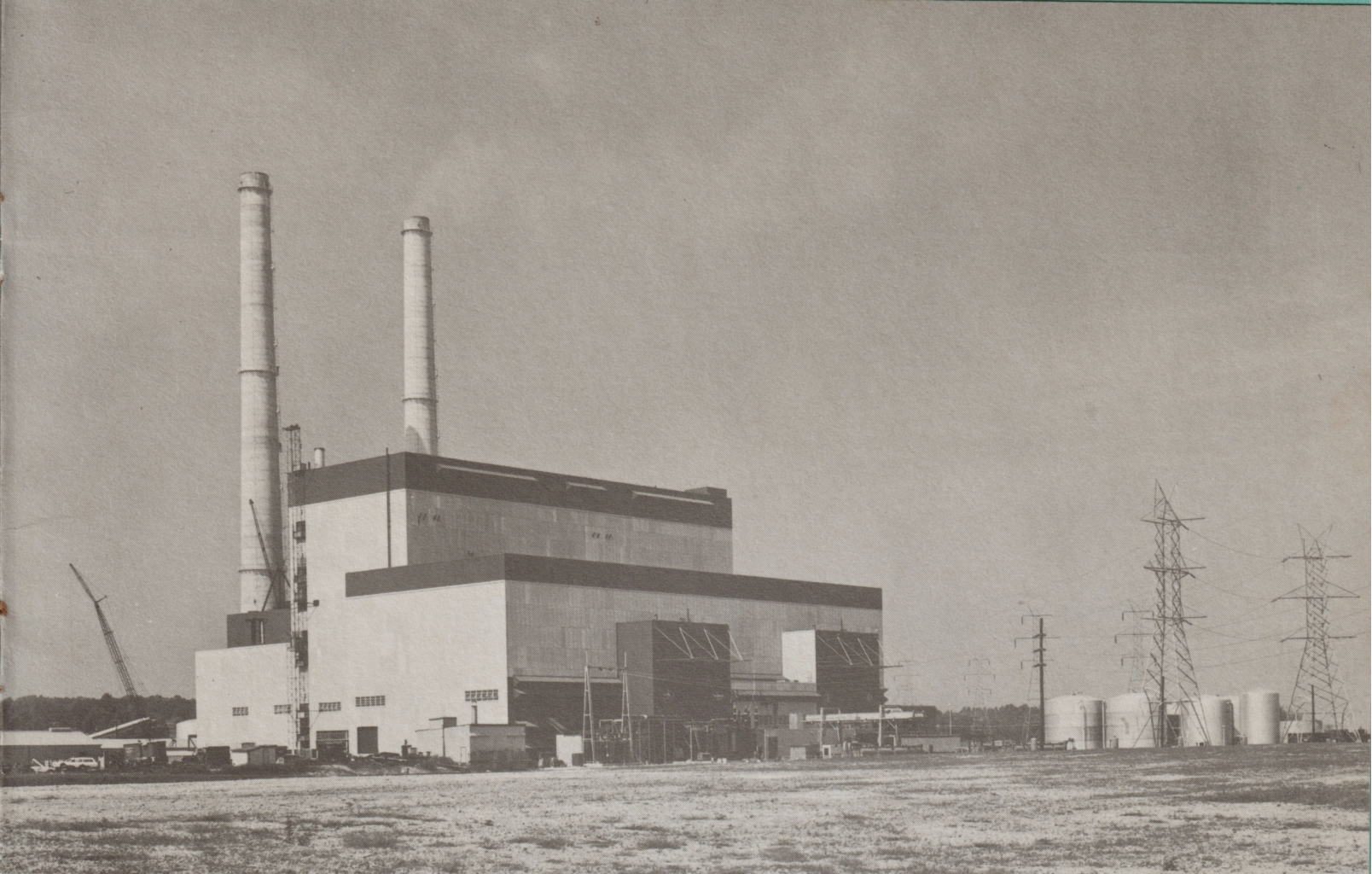
Chalk Point, though it is highly automated, does not control itself. The brains at this new generating station belong to the men who work there. But they have a lot of help—a large, central control room filled with switches, dials and gauges. There are also television screens which allow the operators to see inside the huge boilers. There are instruments which make and record 160 different temperature-checks in each boiler. There are so many controls, in fact, that an electronic computer is used to scan all of them, and record results. The computer does not control the plant, but it helps busy men do more work.

Electronic controls—so many that a computer is needed to scan and log them—give PEPCO employees mastery of Chalk Point's operations from a single room.

On the Line

Chalk Point is now on the line. It is a significant step forward for both PEPCO and the Metropolitan Washington Area. Washington is indeed the reason why PEPCO will continue to expand, to further improve its services, and even, some day, add other great generating stations like Chalk Point to its system.

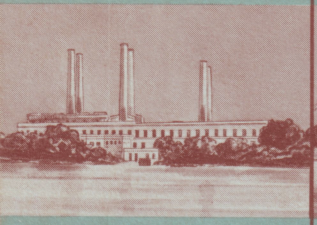
Chalk Point—PEPCO's fifth generating station—is now "on the line," feeding electricity to the fast-growing Washington Metropolitan Area.



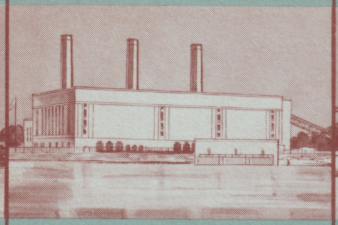
MATCHLESS SERVICE®

PEPCO

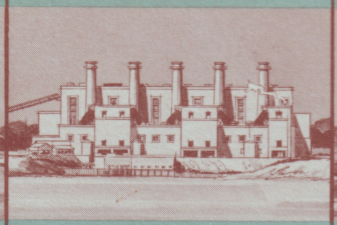
POTOMAC ELECTRIC POWER COMPANY



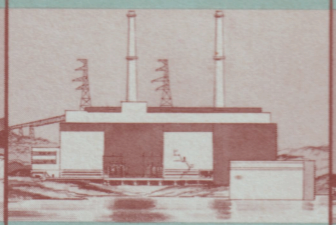
Benning 1907 251,000 kw



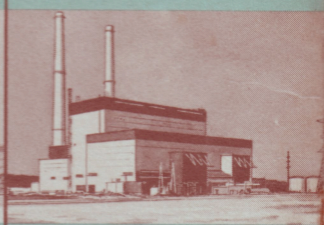
Buzzard Point 1933 305,000 kw



Potomac River 1949 514,000 kw



Dickerson 1959 570,000 kw



Chalk Point 1964 355,000 kw
1965 710,000 kw